LONG RUN TRENDS IN INCOME INEQUALITY IN THE UNITED STATES, UK, SWEDEN, GERMANY AND CANADA:

A BIRTH COHORT VIEW

Lars Osberg
Dalhousie University

INTRODUCTION

What have been the trends in the distribution of income in advanced capitalist countries over the last thirty years? The literature on economic inequality and average living standards has expanded dramatically in recent years and a number of excellent surveys of the major issues[1] document:

(1) The trend in many countries, since the mid 1970s, to increased inequality and polarization of the earned income of men [Jenkins 1995; Gottschalk and Smeeding, 1997]. Although the same has often not been true for women, one might expect such trends to produce greater inequality and poverty in family incomes after taxes and transfer—but is this true and how general is this tendency?
(2) The fact that in a number of countries (for example, the United States and Canada), the rapid rise in average hourly real wages of the early 1970s has been followed by a quarter century of stagnation. However, trends in average income hide the differing experiences of particular birth cohorts, and of different segments of the income distribution. How general is the phenomenon of stagnation in living standards?
(3) Rising differentials in earnings between young and old workers, and an absolute decline in the average real earnings of young workers, (especially those with little education[Beaudry and Green, 2000]) has been combined with persistently high youth unemployment in many countries. Concern with intergenerational inequalities has increased, but how much of aggregate inequality is due to intergenerational differences?

Even if average incomes are stagnant or falling and even if individuals retain the same place in the hierarchy of cohort earnings, it is still possible for each individual to experience, in their own lives, a rising material standard of living. Like a person standing on an escalator that is slowly sinking into the sand, it is possible for an individual to go up all their lives, even if the average is continually going down. As long as the rate at which a cohort's earnings go up with age is greater than the rate

Lars Osberg: Economics Department, Dalhousie University, Halifax, Nova Scotia, B3H 3J5 CANADA. E-mail: osberg@is.dal.ca

Eastern Economic Journal, Vol. 29, No. 1, Winter 2003

at which the average earnings of all age cohorts decline, they personally will be better off over time.

As well, although there are many points of comparison in the income distribution debate (for example, gender, region, race, and so on), a highly salient comparison for most individuals is to compare themselves with other persons of approximately the same age. Individuals who appraise their own economic well-being in terms of lifetime earnings may also be sanguine about age-related differences in income, (even if such differentials influence the aggregate inequality of *annual* incomes) since they may well expect to receive higher incomes as they age themselves. Sociologically, age-related income differentials may also be subject to different norms of equity than are applied to income differentials among those of the same age.

If all this is true, trends in income distribution *among contemporaries* may be particularly important for subjective perceptions, and for the political implications of inequality. Hence, although this paper presents estimates of the trend in distribution and average level of equivalent income among all people, its main emphasis is on following the fortunes of birth cohorts as they aged from approximately 1969/70 to 1994/95. Because the UK, the United States, Canada, Sweden and Germany have been collecting micro data since the early 1970s and have made them available to the Luxembourg Income Study, one can follow the fortunes of birth cohorts in these countries. Since the baby-boom cohort born 1946 to 1959 was 12 to 25 in 1971, 16-29 in 1975, 22-35 in 1981, 25-38 in 1984, 30-43 in 1989 and 35-48 in 1994, this paper follows a "pseudo-cohort" methodology to identify the changing fortunes of birth cohorts.

Trends in the equivalent income of baby boomers are compared to trends in the well-being of those born earlier—who can be labelled "golden agers" (born 1915 to 1929) or " pre-boomers" (born 1930-1945). However, it is particularly interesting to compare baby boomers to those born later—"generation X", (born 1960-1975) and "generation Y" (born in 1976 or after).

Clearly, in 1975 "generation X" were all younger than 16 years old. To estimate their equivalent income as children one must make strong assumptions about the distribution of resources within families. Estimates of the total effective resources available to families also depend on the equivalence scale used to translate the total income of families of different sizes into estimates of average economic well-being. We therefore discuss methodology: the data sets used in this paper, the assumptions underlying the computation of equivalent individual income, and the summary statistics of income distribution and poverty used. We continue by discussing the trends from 1969/70 to 1994/95 in aggregate inequality and in average income and follow the fortunes of the top ten percent and bottom twenty percent of birth cohorts. Finally we discuss the possible implications of income inequality trends in Canada, the United States, Germany, Sweden and the UK.

METHODOLOGY

Population

This paper uses Luxembourg Income Study (LIS) micro data to present point estimates[2] of income distribution trends over time for the following economies: Canada (1971, 1975, 1981, 1987, 1991, and 1994), Germany (1981, 1984, 1989 and 1994),

Sweden (1975, 1981, 1987, 1992 and 1995), United Kingdom (1969, 1974, 1979, 1986, 1991 and 1995), and the United States (1974, 1979, 1986, 1991, and 1994). The focus is on the distribution of equivalent income among individuals, but the statistical starting point is the LIS definition of total household money income after tax (disposable income)[3] as the basis for calculation of the "equivalent income" of all individuals within households. Trends in equivalent income as distributed among all Canadians[4], Americans, Swedes, Germans, and Britons and among the members of five birth cohorts - golden agers (born 1915 to 1929), pre-boomers (born 1930-1945), baby-boomers (born 1946-1959), generation X (born 1960-1975) and generation Y (born 1976 or later)[5] are considered. All summary statistics refer to the distribution of income among all national residents, as listed by LIS, excluding only those economic families or unattached individuals who reported a zero or negative before-tax-money income. In all cases, local currency figures for income have been converted to 1994 U.S. dollars using the relevant country price deflator for consumer expenditure and the 1990 OECD PPP estimates of purchasing power parity for consumption by households.[6]

Equivalent Income of Individuals

Estimates of the economic well-being of individuals within households depend heavily upon the assumptions made about the degree and pattern of economic sharing within households.[7] As well, estimates of the total well-being of the household depend upon the equivalence scale that is used to estimate the economies of scale in household consumption.[8] This paper uses the so-called LIS equivalence scale[9] in which the number of equivalent adults in each household is calculated as $N^{0.5}$. The LIS equivalence scale implies fairly large economies of scale in household consumption—the second person in a household counts as 0.41, the third person receives a weight of 0.32 and a 4-person household is thought of as having the same relative level of consumption needs as two unattached individuals (that is with the same total money income, 2 adults living separately could live as well as the 4-person family living together). This paper makes the assumption of equal sharing among all household members, and calculates the equivalent income of each household member as equal to the total money income of the household, divided by the number of equivalent adults in the household. This equivalent income is assigned to all household members, and the distribution of equivalent income across individuals is then calculated.

Summary Measures of Income Distribution

In Table 1, columns 1 and 2 report the mean and median equivalent individual income. Although mean income is often used as a measure of trends in "average" well-being, it can be heavily influenced by income changes among the very affluent (who are very few in number)—the median is a more robust indicator of trends in "typical" living standards. Column 3 reports the Gini index of income inequality, which is the most popular summary statistic of inequality and is most sensitive to changes in inequality in the mid-range of the distribution. Since the Theil index is more sensitive to the bottom end, and also has the advantage of being additively decomposable, it is presented in column 4.[10] As an indicator of the extremes of the

TABLE 1
Inequality Across Countries
All Individuals - Equivalent Income ($N^{0.5}$ Equivalence Scale)

		Median	Mean Income	Gini	Theil	%<0.5 Median	%>1.5 Median	90/10 Ratio	SST Index
Canada	1971	12,083	13,286	0.315	0.168	16.0	21.0	10.13	0.103
	1975	15,345	16,630	0.288	0.139	13.8	19.0	7.91	0.085
	1981	16,691	18,232	0.283	0.133	12.3	19.8	7.21	0.072
	1987	17,230	18,962	0.287	0.137	12.0	19.7	7.27	0.068
	1991	17,389	19,267	0.284	0.137	11.4	20.1	7.04	0.063
	1994	17,485	19,364	0.286	0.137	11.5	20.4	6.97	0.061
United States	1974	15,906	17,593	0.317	0.171	15.9	21.2	10.17	0.107
	1979	17,092	18,640	0.303	0.151	15.9	21.4	8.96	0.102
	1986	18,077	20,521	0.336	0.187	17.9	24.7	11.03	0.119
	1991	17,715	20,172	0.340	0.190	17.9	24.7	11.14	0.117
	1994	17,511	20,736	0.364	0.224	18.5	26.5	13.50	0.126
United Kingdom	1974	11,158	12,397	0.268	0.127	9.0	18.1	5.72	0.032
	1979	11,773	12,954	0.268	0.119	9.0	19.3	5.67	0.038
	1986	12,211	13,987	0.296	0.149	8.4	22.7	6.73	0.046
	1991	14,175	16,805	0.338	0.210	14.5	25.0	8.70	0.064
	1995	14,166	16,941	0.343	0.209	13.2	24.9	9.26	0.066
Sweden	1975	11,359	11,719	0.214	0.076	6.4	11.3	4.26	0.032
	1981	11,440	11,872	0.196	0.065	5.2	10.4	3.88	0.030
	1987	11,623	11,977	0.217	0.087	7.3	10.5	4.76	0.047
	1992	13,508	14,295	0.228	0.091	6.5	13.1	4.99	0.045
	1995	12,476	13,127	0.220	0.090	6.5	11.8	5.21	0.055
Germany	1981	13,159	14,497	0.245	0.102	5.6	16.6	4.97	0.029
	1984	12,948	14,234	0.250	0.111	6.5	16.3	5.16	0.028
	1989	14,417	15,849	0.248	0.114	5.6	16.3	5.29	0.035
	1994	14,150	15,722	0.272	0.141	8.5	17.7	6.59	0.052
	1994 + DDR	13,659	15,143	0.264	0.133	7.5	17.2	6.09	0.044

All values in 1994 U.S. dollars (OECD PP)

income distribution, column 7 shows the ratio between the average incomes of the top 10 percent of persons and the average income of the bottom 10 percent, while column 6 has the percentage of the population with equivalent income greater than 150 percent of the median. Together, column 6 and the poverty rate (percentage below half the median equivalent income—column 5) have often been used as a guide to the degree of "polarization" in living standards.

In international comparisons, a frequently used relativistic conception of poverty draws the poverty line at one half the median national standard of living [Hagenaars, 1986, 1991; Osberg, 2000]. This paper takes the view that within each country social norms of poverty may change over time, but at any point in time these norms (which Smith [(1776)1961, 339] referred to as "those things which the established rules of decency have rendered necessary to the lowest rank of people") apply to all cohorts—thus within each country the poverty line in real income terms is the same for all

birth cohorts in any given year. However, although the poverty rate is undoubtedly the most commonly used measure of poverty, it does not reflect the amount by which the incomes of the poor fall below the poverty line and it ignores the degree of inequality among the poor. For these reasons, column 8 presents the Sen-Shorrocks-Thon (SST) index of poverty intensity, which can be calculated [Osberg and Xu, 2000] as:

$$P(Y; z) = (RATE)\,(GAP)\,(1+G(X)), \tag{1}$$

where *RATE* is the poverty rate, and *GAP* is the average poverty gap ratio among the poor. Since $(1+G(X))$ is in practice nearly constant over time and across countries [Osberg, 2000, 852] the SST index is roughly proportional to the expected poverty gap of a randomly selected individual (that is the crude probability of poverty multiplied by the expectation of the poverty gap, conditional on being poor).

Demographic Change and Trends in Equivalent Income

In the quarter century leading up to 1994/95, social institutions in developed countries changed substantially, one sign of which is a reduction in the average size of households (in Canada, from 2.86 in 1971 to 2.51 in 1994). Even if average real money income *per family* were constant, the fact that a given income is shared among fewer individuals within families could be expected to increase average effective income—and the effect is appreciable in some countries. Using the LIS scale, a decline from 2.86 members to 2.51 would (holding family money income constant) raise equivalent income by about 6.7 percent—and since this average change is in fact the result of unequal changes at different points in the distribution, demographic change is likely to affect the distribution of effective income as well.

Although for society as a whole the average size of economic families changes rather slowly, change in the family circumstances of individuals as they progress through the life cycle is much more dramatic. Because substantial changes in family size are associated with predictable events (such as "growing up and leaving home"), cohort comparisons are likely to be severely misleading if they are based on either individual income or total family income. In some cohorts, the quarter century to 1994 saw particularly large changes in family size—for example in Canada, the average family size of golden agers (born before 1930) fell from 3.6 to 1.95 from 1971 to 1994. Although their average family money income fell by some 19 percent (after inflation), it was shared by far fewer people—the magnitude of the decline in their average family size implied that average real equivalent income rose by 70 percent.[11] For both the youth cohort who are leaving the parental home to set up new households and seniors (who often suffer the death of a spouse), change in family size is particularly large, and the adjustment for economies of scale in household consumption is particularly important.

Trends in the United States, the UK, Sweden, Germany and Canada

The major message of Table 1 has been expressed before by others, but nevertheless deserves repeating. As Atkinson has said: "There is considerable diversity of

national experience with regard to the distributions of income and earnings; it is misleading to talk of a general "trend" toward increased dispersion"[1998, 11].

Looking first at the poverty rate—the percentage of the population with incomes below half the median (column 5)—one can find in Table 1 a trend to a decreasing poverty rate (Canada), substantially increasing poverty rate (the United States and UK), somewhat increasing poverty rate (Germany)[12] and stable poverty rate (Sweden). However, as already noted, the poverty rate is not a particularly good index of poverty. The SST index (column 8) builds into the measurement of poverty a consideration of the average poverty gap ratio (and the inequality of poverty gaps), and the picture it paints is a bit more complex. Measured by the SST index, Canada still has a substantial decline in poverty up to 1994, albeit from a relatively high initial level. The the United States has both a high initial level, and a substantial increase, in poverty intensity after 1979 while the UK has an even larger increase in poverty intensity, but started from a lower initial base and therefore ends up at a level comparable to Canada's. In both the United States and the UK, the trend to greater poverty intensity is steady from the early 1980s on and comes from both an increased rate and an increased average poverty gap. Alternatively, although Sweden had a fairly steady poverty rate for the period as a whole, it had an overall increase in poverty intensity, because the average poverty gap widened.

The overall picture for polarization is just as nationally nuanced. In Canada, Sweden and Germany, the percentage of people above 150 percent of the median income was nearly constant. Hence, if "polarization" is measured by the total percentage of the population with a standard of living outside the band 0.5 to 1.5 the median income, all the change in polarization in those countries was due to the changing percentage below half the median income—that is, the changes in the poverty rate (which moved down in Canada, slightly up in Germany and remained flat in Sweden). In the United States and UK, on the other hand, substantial increases were observed in both the fraction of the population below half the median income and above 150 percent of the median—so polarization increased at both ends of the income distribution, and increased substantially.

This paper looks at income from the perspective of the consumption possibilities it enables, so inequality in after-tax, after-transfer household equivalent income is the appropriate concept. As measured by either the Gini or Theil indices, income inequality declined in the 1970s in all five countries and obeyed no consistent trend across countries after 1980. The Canadian data are marked by an initial decline in inequality in the early 1970s which continued slightly in the late 1970s, but the 1981 to 1994 data for Canada is essentially flat. Inequality in the United States and UK also fell from 1974 to 1979, but both countries show a strong trend to greater inequality from 1979 to 1994/95. In Sweden, inequality fell from 1975 to 1981 before rising through 1992 and falling slightly in 1995. German data from 1981 to 1994 (if one looks only at the former West German states) show an upward trend in inequality. The only consistent part of the story is the decline in income inequality observed in all five countries in the l970s[13]—after which a variety of trends are to be observed.

In the popular press, one often hears reference to differences between the "typical" outcomes of different generations and some economists [Kotlikoff, 1992] have

TABLE 2
Inequality in Equivalent Income
Percentage of Total Inequality Arising from within Cohort Differences in Income Using the Theil Index

	1995	1994	1981	1979
Canada	—	96.3	91.9	—
United States	—	93.9	—	90.1
United Kingdom	94.9	—	—	89.0
Sweden	91.6	—	93.8	—
Germany	—-	96.5	90.7	—

Each cell entry = $(\Sigma_g((n_g Y_g)/(nY))\times R_g)/R$,where R_g is the cohort Theil index; R is the Theil index for all individuals; n_g is number in cohort g; n is total population; Y_g is average income of gth cohort; Y is average income of all persons.

emphasized the idea of "generational accounting" and the study of intergenerational differences (for a contrary view, see Osberg [1998]). Since this paper will discuss differences in the experiences of different birth cohorts, there may be a tendency to overemphasize the relative importance of differences between generations in average incomes, compared to the differences in individual incomes within generations. Table 2 is intended to be an antidote to any such tendencies. It uses the additive decomposition property of the Theil index of inequality[14] to present the percentage of aggregate inequality (column 4 of Table 1) that can be explained as arising from intracohort inequality. The remainder of aggregate inequality (less than 11 percent for all five countries) can be ascribed to the differences between generations in average incomes, but the point of Table 2 is to emphasize that it is differences among individuals of approximately the same age that dominates the extent of inequality in all countries.

Table 3 therefore follows the fortunes of three cohorts—pre-boomers, boomers and generation X—as they age. Notably, the trend in median income of particular cohorts may not be predicted particularly well by median income of the entire population. In the United States, for example, from 1986 to 1994 the median income of all persons fell by about 3.1 percent (from $18,077 to $17,511), but the baby boomers were moving into their peak earnings years and their median income rose by 11.7 percent (from $19,187 to $ 21,430). Over this period, declines in median income were concentrated in the cohorts younger and older than the boomers. Divergence in cohort experience is often seen in other countries as well—for example in the UK from 1991 to 1995, when boomer median incomes rose, while pre-boomers and generation X saw a decline or in Canada where pre-boomer median incomes fell from 1987 to 1994 while boomers and generation X saw a median income increase.

Either between cohorts in the same country or across countries, movements of median income diverge considerably. Hence it is hard to generalize about whether the typical earnings of a birth cohort grew or fell—but there is a common trend of rising inequality within cohorts (as measured by the Gini index) after about 1980. In some countries, the trend begins in the 1970s and across countries it differs in magni-

TABLE 3
Trends in Intra-Generational Income Distribution

	Pre-Boomers			Baby Boomers			Generation X		
	Ages	Median	Gini	Ages	Median	Gini	Ages	Median	Gini
				Canada					
1971	26-41	13,038	0.286	12-25	11,535	0.302	0-11	11,112	0.287
1975	30-45	16,559	0.263	16-29	15,440	0.253	0-15	14,151	0.268
1981	36-51	19,336	0.265	22-35	16,917	0.262	6-21	15,174	0.271
1987	42-57	20,474	0.283	28-41	18,033	0.268	12-27	17,503	0.283
1991	46-61	21,267	0.288	32-45	18,329	0.273	16-31	17,980	0.281
1994	49-64	19,857	0.300	35-48	19,269	0.274	19-34	18,165	0.285
				United States					
1974	29-44	17,471	0.288	15-28	16,317	0.303	0-14	14,159	0.298
1979	34-49	20,015	0.271	20-33	17,259	0.279	4-19	15,114	0.295
1986	41-56	23,008	0.311	27-40	19,187	0.310	11-26	17,425	0.332
1991	46-61	23,066	0.326	32-45	20,023	0.314	16-31	17,270	0.331
1994	49-64	22,665	0.355	35-48	21,340	0.335	19-34	16,869	0.356
				United Kingdom					
1974	29-44	11,704	0.245	15-28	12,680	0.245	0-14	10,162	0.232
1979	34-49	13,408	0.248	20-33	13,119	0.255	4-19	11,822	0.243
1986	41-56	15,258	0.282	27-40	13,104	0.302	11-26	13,944	0.278
1991	46-61	17,111	0.349	32-45	16,106	0.314	16-31	16,713	0.309
1995	50-65	15,640	0.331	36-49	17,313	0.331	20-35	15,663	0.341
				Sweden					
1975	30-45	12,672	0.184	16-29	11,450	0.223	0-15	11,672	0.169
1981	36-51	12,983	0.190	22-35	12,019	0.169	6-21	11,180	0.209
1987	42-57	14,200	0.202	28-41	12,390	0.187	12-27	10,933	0.244
1992	47-62	17,400	0.210	33-46	15,023	0.196	17-32	12,148	0.253
1995	50-65	14,902	0.213	36-49	13,818	0.194	20-35	11,547	0.223
				Germany					
1981	36-51	14,727	0.220	22-35	13,363	0.230	6-21	12,279	0.216
1984	39-54	14,893	0.227	25-38	12,560	0.249	9-24	13,009	0.236
1989	44-59	16,805	0.238	30-43	15,244	0.242	14-29	14,830	0.246
1994	49-64	16,160	0.286	35-48	15,369	0.265	19-34	14,405	0.254
1994 + DDR	49-64	15,310	0.281	35-48	14,943	0.261	19-34	13,815	0.251

Using After-Tax Equivalent Income - $N^{.5}$ Equivalence Scale: All dollars in US 1994 (OECD PPP)

tude—but it can be observed in all five nations. It is this *combination* of rising intra-cohort inequality and divergent trends in median cohort income (and associated inter-cohort inequality) that explains the divergence of aggregate inequality trends.

However, what do these trends mean for actual living standards? Since percentage shares may be harder to visualize than money incomes, Table 4 presents the average income, in 1994 U.S. dollars, of individuals in each decile of the distribution of equivalent income in the mid 1990s. Readers who are looking for their own income in Table 4 should remember to convert household income into equivalent individual income (for example a four person family with an $84,000 income after tax and transfers would all be in Canada's top decile). One must also caution that Table 4 captures only the money income of households, and ignores the time that households devote to earning that income. The five countries examined here differ dramatically in the

TABLE 4
Average Equivalent After Tax Income for All Individuals in 1994 US$ by Decile ($N^{0.5}$ Equivalence Scale)

Decile	1	2	3	4	5	6	7	8	9	10
Canada 94	6003	9720	12,074	14,232	16,417	18,608	21,231	24,450	29,065	41,846
United States 94	3972	7725	10,512	13,201	16,019	19,144	22,675	27,047	33,457	53,610
UK 95	4731	7374	8976	10,876	13,000	15,318	18,002	21,216	26,065	43,826
Sweden 95	4736	8518	9955	11,014	11,961	12,993	14,086	15,548	17,778	24,665
Germany 94	5225	8693	10,419	11,914	13,398	14,949	16,689	19,069	22,394	34,420

annual number of work hours per adult aged 15 to 64—in 1994, the United States had the highest average hours (1,384.6), followed by Canada (1,187.3), the UK (1,182.8), Sweden (1173.1), and Germany (992.3).[15] Furthermore, trends over time have differed substantially—between 1980 and 1994 annual working hours per adult rose by 159.8 hours in the United States, and 25.9 hours in Sweden, but fell by 162.4 hours in Germany, 31.3 hours in Canada and 70.1 hours in the UK. As well, both the "social wage" of public services that individuals receive from government and the value of implicit income from home ownership and the services of consumer durables owned by households are not captured in Table 4.

Nevertheless, for some purposes, these omissions accentuate the implications of Table 4. In money income terms, Americans in the bottom decile of the income distribution are absolutely worse off than those in the bottom decile in any of the other four countries, while the top decile is significantly better off than anywhere else. Although the top decile of UK residents is second only to the top U.S. decile in average income, the bottom forty percent of the UK have less income than the bottom two quintiles anywhere else. However, Canadians in the bottom half of the income distribution have a higher income than comparable people anywhere else.

But do *absolute* income levels matter much?

For most of the income distribution, it may be *relative* income or *trends over time* that are more important. Although the top decile of the income distribution may travel internationally with sufficient frequency to make comparisons of absolute standards of living, and perhaps become envious of lifestyles elsewhere, most other people have little direct observation of the income available to their peers in other countries. In political terms, invidious international comparisons among the affluent of absolute living standards elsewhere may be very important, but, for most of the income distribution, the relevant issue is whether income lives up to expectations. The relevant comparison of current incomes is to actual experience in the past (which likely dominates expectations for the future). Table 5 therefore presents the change over time in the average income of decile groups in the distribution of equivalent income.

If individuals change their rank in the income distribution, these deciles of the income distribution will consist of different persons, but if one wants to assess trends in inequality, the issue is whether income mobility within cohorts has increased or decreased over time. In the United States, Mishel et al. conclude that: "the rate of mobility appears to have declined since the late 1960s" [1999, 89]. Dickens' conclu-

TABLE 5
Annual Percentage Change in Mean Equivalent Income by Decile

	Decile	Canada 81/94	US 79/94	UK 79/95	Sweden 81/95	Germany 81/94
All	1	0.97	−0.77	−0.01	−0.64	−0.88
	2	0.59	−0.44	0.58	0.60	0.15
	3	0.34	−0.37	0.53	0.72	0.39
	4	0.30	−0.24	0.77	0.71	0.50
	5	0.38	0.00	1.09	0.64	0.59
	6	0.37	0.30	1.39	0.63	0.54
	7	0.41	0.51	1.67	0.56	0.50
	8	0.43	0.76	1.87	0.64	0.64
	9	0.44	1.06	2.27	0.73	0.78
	10	0.68	2.21	3.95	1.58	1.34
Gen. X	1	1.96	−0.27	−0.28	0.02	−2.03
	2	1.25	0.34	0.09	0.02	−0.27
	3	1.11	0.50	0.69	0.08	0.52
	4	1.17	0.47	1.35	0.16	0.85
	5	1.43	0.60	1.79	0.22	1.20
	6	1.63	0.92	2.24	0.31	1.45
	7	1.84	1.27	2.64	0.35	1.60
	8	1.91	1.59	3.06	0.39	1.83
	9	1.96	1.95	3.48	0.37	1.68
	10	1.93	3.17	5.21	0.69	1.06
Boomers	1	1.33	0.14	−0.11	0.93	0.13
	2	0.95	0.59	0.47	0.91	0.73
	3	0.93	0.88	1.18	0.93	1.02
	4	1.02	1.16	1.70	1.06	1.21
	5	1.03	1.44	1.90	1.09	1.25
	6	1.10	1.66	2.06	1.04	1.10
	7	1.14	1.78	2.09	1.12	1.00
	8	1.21	1.98	2.28	1.27	1.12
	9	1.23	2.32	2.72	1.41	1.76
	10	1.68	3.61	4.78	2.37	2.62
Pre-	1	−0.98	−0.99	0.09	1.57	−1.16
Boomers	2	−0.86	−0.35	0.09	1.15	−0.17
	3	−0.42	0.02	0.27	0.99	0.41
	4	−0.05	0.39	0.50	1.03	0.74
	5	0.11	0.75	0.91	1.04	0.72
	6	0.26	1.08	1.17	1.13	0.74
	7	0.27	1.43	1.39	1.26	1.05
	8	0.40	1.79	1.60	1.22	1.16
	9	0.59	2.27	2.05	1.35	1.66
	10	0.98	3.90	4.00	2.57	3.26
Golden	1	4.13	0.57	1.16	0.86	0.35
Agers	2	0.71	−1.12	0.00	−0.24	−0.02
	3	−0.67	−1.52	−0.65	−0.36	−0.06
	4	−1.35	−1.56	−1.05	−0.51	−0.22
	5	−1.73	−1.55	−1.22	−0.74	−0.66
	6	−1.79	−1.49	−1.22	−0.90	−0.78
	7	−1.78	−1.32	−1.16	−0.97	−0.79
	8	−1.66	−1.12	−0.90	−1.04	−0.68
	9	−1.50	−0.68	−0.52	−0.92	−0.38
	10	−0.83	1.02	0.77	0.26	−0.43

sion for the UK is similar: "earnings mobility has fallen since the late 1970s" [1999, 223]. Alternatively, Baker and Solon [1998] use income tax data to conclude that the year to year instability of income in Canada has risen from 1975 to 1993. Since trends in the average income of income deciles represent shifts in the pattern of ultimate economic rewards across individuals *given* the degree of individual mobility from year to year, and since there is some evidence of *decreased* mobility in the two countries that have demonstrated the greatest increase in income inequality, these trends in inequality of outcomes may understate tendencies to greater inequality of opportunity.

Table 5 summarizes the different long-term experience of deciles of the income distribution. It presents the average annual percentage change in the mean equivalent income of each decile of the income distribution, over the period 1980 to 1995 (approximately) when the trend to greater equality of the 1970s may have been reversed.

Since the data sets contained in LIS in fact have dates that do not align exactly, the overall change in income has been annualized, as an arithmetic average of total percentage change. This procedure has the advantage of allowing each country to be directly compared but the disadvantage of not fully conveying the cumulative impact of differential rates of growth of income. Over the sixteen-year period 1979 to 1995 the incomes of the top decile of UK baby boomers grew by 76.5 percent, and the top decile of UK generation X enjoyed an 83.3 percent increase in average income. Gains at the top of the United States income distribution were large (at 54.1 percent for boomers and 47.6 percent for Xers), but not nearly as large— and no other country comes close to matching the cumulative gains of the top decile of the United States and the UK.

From 1980 to 1995, the cohort born between 1914 and 1929 aged from being 51 to 66 to being 66 to 81. Although most "golden agers" were in the paid labor force in 1980, almost all had retired by 1995. As earnings were replaced by pensions, the money incomes of most deciles of the income distribution in all countries fell. However, the structure of the income support system for the elderly matters a lot. In some countries (especially Canada) the presence of a floor to old age security benefits which is higher than social assistance for the non-elderly has meant that the poorest decile are actually better off in their retirement years than in their working years.[16]

Countries differ in the extent to which the old age security system emphasizes earnings-related pensions over flat rate, needs-based benefits. In the United States, there are broadly similar declines in the income of all but the poorest and richest deciles, as the Social Security system replicates for the pensions of the retired much of the inequality in earnings which they experienced as workers. This tendency is less marked in other countries. In both Canada and the UK the bottom quintile was better off in retirement than during their working years. Despite much media comment in the United States on the affluence of the elderly, it is notable that the decline in income of the cohort moving into retirement is significantly larger in the United States than it is for most other countries.

The difference between the experience of cohorts as they enter retirement and as they progress through their working years is worth emphasizing because it can shape overall perceptions of income trends. The top panel of Table 5 indicates that among

all Americans, the bottom half of the income distribution was better off, in real equivalent money income, in 1979 than in 1994. Overall, the average income of Americans rose by 11.2 percent, but *all* the gains in income of this 15-year period (and then some) were concentrated in the top half of the income distribution. Cumulatively, over this 15-year period the bottom decile had an income drop of 11.62 percent but the top quintile averaged a 24.6 percent increase and the top decile had an income gain of 33.2 percent.

However, declines in average income are not generally found in the lived experience of birth cohorts. As the bottom panels of Table 5 indicate, most deciles of each cohort of Americans experienced some increase in equivalent income over the period as a whole. The poorest decile of generation X had a small (cumulatively equal to 4.1 percent) decline in real income, as did the poorest quintile of pre-boomers, (which may be due to labor market entry among the former and early retirement among the latter) but in no other case is an actual decline in income observed. Hence, although Americans may be disappointed with their average rate of income increase, within each cohort's working life the within-cohort distribution of income has in general been moving up slightly in real terms.

However, it is a slightly different issue to ask if people are as well off as their parents were at a comparable age. Although Table 5 presents the cumulative percentage gains or losses of each decile, it does not enable one to compare the absolute income of cohorts, or the evolution over time of their income. For this, we turn to graphical methods. Figures 1a and 1b follow the fortunes of the poorest quintile of each country as cohorts have aged over the quarter century leading up to 1994/95 and Figures 2a and 2b present comparable data for the top ten percent. In each case, average incomes have been converted to 1994 U.S. dollars using the OECD Purchasing Power Parity ratios for consumer expenditure. Age is calculated as the mid-point of each cohort's ages, at each point of observation.

One way of using these figures is to answer the question: "Have the poorest and richest of each generation experienced, in their own lives, an increasing or decreasing absolute standard of living?" During this 25-year period, the birth cohorts overlap for about ten years, so a second way of looking at the data is as an answer to the question: "Am I better off, or worse off, than people like me were at the same age, in the previous generation?" The answer to both questions is likely to be important for perceptions of whether there is "progress" in living standards.

For Canada, Figure 1a indicates that the poorest quintile of Canadians in each cohort are generally better off over time (with the sole exception of the pre-boomer cohort in their late forties), and significantly better off than the previous cohort at the same age. Figure 1b indicates that the same is true, with the exception of the 1960-1975 cohort, in Sweden. However, the same is not true for the poorest twenty percent of Americans and Britons. Whatever benefits twenty five years of growth have brought to the affluent of the United States and UK, the bottom part of the income distribution has not shared in that growth. With one exception, each cohort of the poor has received a lower income than the previous cohort at the same age, and has ended the period with essentially the same, or a lower, real income than when it started. The one exception is the bottom quintile of baby boomers in the United States,

FIGURE 1a
Mean Equivalent After-Tax Income (Bottom Quintile)
Canada and the United States

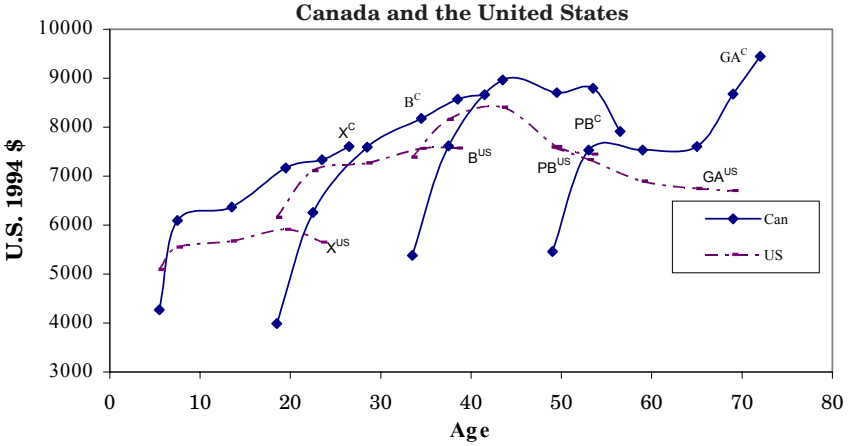
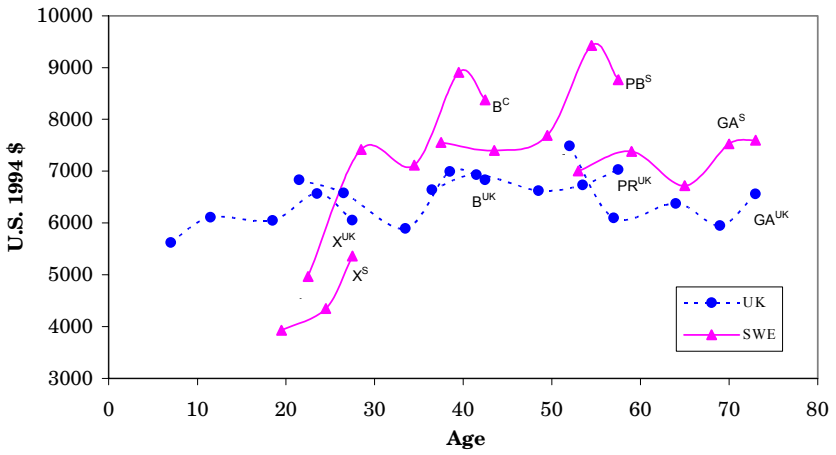


FIGURE 1b
Mean Equivalent After-Tax Income (Bottom Quintile)
UK and Sweden



Generation X(born 1960–75) = X; boomers (born 1946–59)=B; pre-boomers (born 1930–45)=PB; golden agers (born 1915–29)=GA; Canada=C, United States = US; United Kingdom=UK; Sweden=S.

who experienced some increase in average equivalent income as they aged (although still ending with less real income than the earlier cohort at the same age).

As Figure 2a illustrates, the incomes of the top ten percent of each Canadian cohort have risen over time, and relative to the income of earlier cohorts at the same age. The1914-1929 cohort experienced a drop in their income with retirement and the income profile of the 1930-1945 cohort is one of the few age/income profiles to have the nice quadratic shape so beloved in labor economics texts. However, if affluent Canadians looked only to their own history, or that of the previous generation, they would have grounds for quiet satisfaction.

FIGURE 2a
Mean Equivalent After-Tax Income (Top Decile)
Canada and the United States

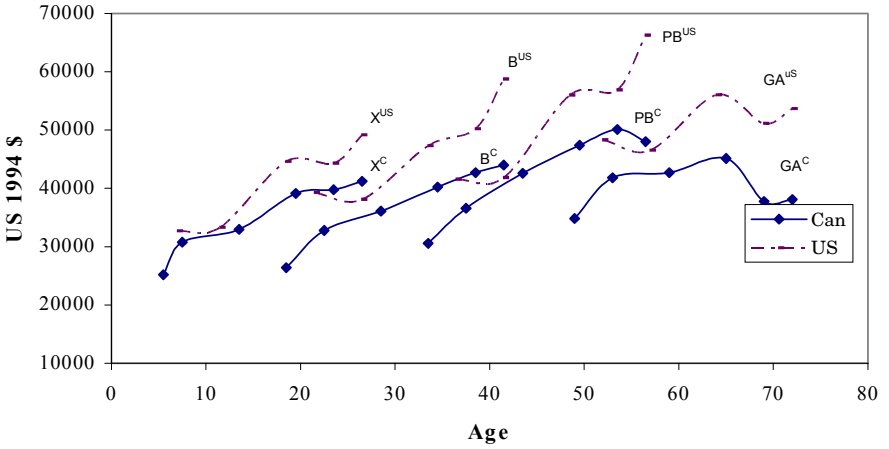
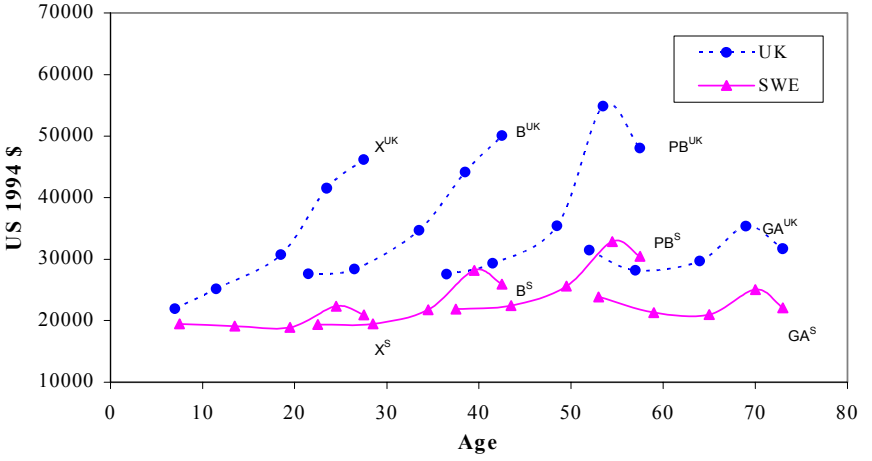


FIGURE 2b
Mean Equivalent After-Tax Income (Top Decile)
UK and Sweden



Generation X(born 1960–75) = X; boomers (born 1946–59)=B; pre-boomers (born 1930–45)=PB; golden agers (born 1915–29)=GA; Canada=C, United States = US; United Kingdom=UK; Sweden=S.

However, affluent Canadians have only to look south of the border to find grounds for envy. The top decile of each cohort of Americans has done much better than their counterparts in Canada—both relative to their initial incomes and relative to earlier cohorts. And envy only intensifies if affluent Canadians should compare themselves to the top decile of Britons (Figure 2b), whose income increase has been truly spectacular. To the extent that Canadian elites live in the cultural periphery of the United States and the UK, one may expect to see greater elite dissatisfaction in Canada

than their own actual experiences might warrant—while American and British elites have no grounds for dissatisfaction at all.

As Figure 2b also indicates, the average money incomes of the top decile of Swedes shows even less increase over time than the Canadian data, either over the life course of particular cohorts or compared to the earlier cohort.[17] All cohorts have experienced a real income decline in the 1990s. One wonders whether such trends will produce discontent, and of what variety.

CAVEATS AND CONCLUSIONS

Although the calculation of equivalent income represents an important improvement over average money income per household, or the distribution of per capita income, the average equivalent income of each household member is *not* a full measure of economic well-being. Among the issues this paper has, for reasons of space, ignored are inequalities within the family, the possible endogeneity of household size to trends in equivalent income, the imputed rent and capital gains arising from home ownership, the opportunity cost of the time supplied by households to the paid labor market in order to earn income, and the increase in economic insecurity, which has been greatest among youth [Osberg, Erksoy, and Phipps, 1998].

In international comparisons, one must also add the "social wage" of public services. Smeeding et al. conclude that "noncash income reinforces the redistributive impact of conventional (cash) tax-transfer mechanisms rather than acting to offset them in any major way"[1993, 229], so the qualitative conclusions of this paper on inequality differences across countries are unlikely to be reversed. However, this paper's omission of the social wage means that comparisons of the absolute level of money income between, for example, countries such as the United States and Sweden are a misleading indicator of absolute levels of economic well-being.

Finally, one must note that this paper does stop at 1994/95. Since then, economies have changed. For example, in the late 1990s the United States enjoyed very low unemployment, which had positive impacts on the earnings of the low paid, while Canada has made major cuts to many of the transfer programmes for working age adults that have mitigated poverty and inequality in the past (for an extended discussion, see Osberg, [2000]).

In the large literature on economic inequality that now exists, it is depressingly common to observe such statements as: "what holds true for earnings holds true for income as well" [Higgins and Williamson,1999, 6]. Based on such an assertion, the author's next step is usually to construct a highly simplified model of the labor market and argue that a general trend to greater inequality is due to one (or perhaps two) major inexorable causes—such as cohort size [ibid.], or "skill"-biased technological change or globalization of trade. If such causal factors are arguably difficult to affect by public policy, one may find the author urging the TINA— There Is No Alternative—position.

However, market forces always operate within an institutional context, and changes in such institutions as minimum wages and unionization have been responsible for a significant fraction of the rise in inequality of hourly wages observed in the

United States [DiNardo, Fortin and Lemieux,1996]. Furthermore, even if changing market forces are driving part of the changes in the "price" of labor, it is the hourly wages of individuals which are affected, and it is a long way from there to the distribution of annual equivalent income.

At any point in time, countries make choices about the institutional context of the labor market and also about the macroeconomic demand management policies that help determine how many people are working, and for how many hours per year. There is substantial evidence that individuals cannot necessarily get all the hours of work they desire at the going wage, and that demand-side constraints are particularly important for the lower paid [Osberg and Phipps, 1993]. Trends in the inequality of hourly wages therefore have to be combined with trends in the determinants of annual hours, before the inequality of individual earnings can be derived. Combined with individual preferences, public choices on macroeconomic policy heavily influence the distinction between inequality of wages and inequality of earnings. Over time, countries also make choices about their public investments in the education and training of each generation of workers, which affect the structure of supply of human capital, and choices about the industrial policy, which influences the structure of the demand side. Given the variety of public policy choices which affect individual labor market outcomes, it is not surprising that countries differ in the trends observed in inequality of individual earnings.[18].

Household income depends on household composition (that is, on the processes determining formation, dissolution and size of households), on the total market income of all household members from capital (which is influenced by inheritance patterns and taxation) as well as from labor, on the transfer incomes for which household members are eligible and on the household's treatment by the tax system. Trends in the inequality of household income depend on changes in all these variables, some of which are heavily influenced by the public policies of governments, but some of which depend more on shifts in culture and society (both of which vary by country). National differences in culture and politics, and the vagaries of the evolution of such differences, thus have many channels of influence—and no segment of the income distribution is insulated from the impact of political decisions and public policy.

It is not, therefore, really surprising to find a diversity of national experiences—as Brandolini puts it: "Neatly defined and unambiguous trends are unlikely to result from this multiplicity of factors"[1998, 38]. This paper has found a diversity of trends, both in the aggregate and in the experience of particular birth cohorts, and there is every reason to expect that diversity to continue.

However, one lesson from the data is how quickly the income distribution can change—particularly in the tails. Although the prevailing wisdom in the early 1970s was that studying the income distribution was "like watching grass grow," because change was so slow, the period since 1980 has seen real differences emerge in fairly short order. There has been a substantial increase in inequality and polarization in the United States and the UK in a 15-year period. In the early 1970s, Canada and the United States were very similar in income distribution, and both were high-inequality countries compared to the UK. By 1994/95, Canada and the United States were clearly different from each other and the UK had emerged as a relatively high

TABLE 6
Hypothetical Transfer of One Tenth of Top Decile's Income Gain to Bottom Decile

	Poverty Rate (Percent)	Average Relative Poverty Gap	SST Index
UK[a]			
Actual 1979	9.0	0.218	0.038
Actual 1995	13.2	0.259	0.066
Hypothetical 1995	8.1	0.186	0.030
United States[b]			
Actual 1979	15.9	0.335	0.102
Actual 1994	18.5	0.360	0.126
Hypothetical 1994	18.5	0.278	0.097

a. UK 1979-1995 Average equivalent income of top decile increased from $26,865 to $43,826 (1994 US $)—transfer to bottom decile of $1696 per capita simulated.
b. United States 1979-1994 Average equivalent income of top decile increased from $40,248 to $53,610 (1994 US $)—transfer to bottom decile of $1336 per capita simulated.

inequality, high poverty country by European standards. Change in Germany and Sweden was much more muted.

It should not be particularly surprising that the position of the poor can change quickly. Precisely because they have little to begin with, relatively small real transfers can make a big percentage difference. The poor can benefit a lot (or lose a lot) from policy changes that make relatively little difference to the more affluent.

For example, the top decile in the UK experienced a $16,961 *increase* in real equivalent income from 1979 to 1995, which was more than twice the *total* average income of the bottom twenty percent ($6053 in 1995). The comparable change for the top decile in the United States from 1979 to 1994 was +$13,362 per person (on a base of $40,248), an increase that was also more than twice the average level of income of the bottom twenty percent (who in fact averaged a decline of $668 for each person in the bottom quintile from 1979 to 1994, ending up with an average income of $5,849.)

Table 6 presents the results of a thought experiment. Suppose that the tax transfer system in the United States and UK had been marginally more redistributive and *ten percent of the gains* of the top decile had been transferred to the bottom decile in those countries. What difference would this transfer have made to poverty? Had the already affluent shared only *10 percent of their gains* (for example about 3 percent of total income) through the tax/transfer system, the poverty rate in the UK would have dropped from 13.2 percent to 8.1 percent and the intensity of poverty, as measured by the SST index, would have more than halved. By any measure, poverty in Britain would have fallen dramatically from its actual 1995 levels, to levels well below those of 1979. Since the income gains of the affluent were not quite as dramatic in the United States as in the UK, and because the United States starts from a much higher level of poverty, a similar transfer would not be enough to push the poorest ten percent of Americans over the poverty line—but the depth of their poverty would be cut

by about a quarter and the intensity of poverty, as measured by the SST index, would be somewhat less than in 1979.

The point of this example is not political realism—rather it is to stress the sensitivity of poverty outcomes to shifts in income that are rather small fractions of the recent income gains of upper income groups. In Table 6, only 10 percent *of the income gains* of the top 10 percent are being redistributed—none of their previous income, and none of the income of the bottom 90 percent, is being touched. A relatively small change in the tax/transfer system could have entirely forestalled the increase in poverty intensity that actually occurred in these countries. Implicitly, therefore, Table 5 reinforces the potential importance of the politics of income distribution—over and above any influences of labor market changes.

If one thinks about potential discontent with the distribution of income, the issue for the United States and the UK is whether or not pressure will arise for the fruits of growth to be shared. The evidence is fairly clear in these countries that the bottom deciles of each cohort are not seeing much sign of economic progress, either over their own lives, or compared to the earlier generation at a similar point in their lives. However, although the political pressure for change may come from the bottom in the United States and UK, in Canada and Sweden the more likely locus for political discontent is the top of the distribution. The "demonstration effect" of the United States and the UK has shown how the fruits of growth can be appropriated by the already affluent—and the envious rich in Canada and Sweden may desire to emulate this model. Time will tell whether the political process responds with more alacrity to pressure from the top, or from the bottom, of the income distribution.

NOTES

This is a revised version of paper presented at CRESP Workshop, "Equality, Security and Community", Vancouver, 21 October 1999 and at The Jerome Levy Economics Institute conference, "The Macro dynamics of Inequality in Advanced and Developing Countries", Annandale on Hudson, New York, 28 October 1999 which circulated as Working Paper No. 222, Luxembourg Income Study, January, 2000. The support of SSHRC under grants 410-97-0802 and 412-97-0003 is gratefully acknowledged. Thanks to Lynn Lethbridge for exemplary research assistance and to Lori Curtis, Jeff Dayton-Johnson, Shelley Phipps, Kuan Xu and two referees for their comments on an earlier draft—errors remaining are my own.

1. This paper's methodolgy is similar to Osberg [1997]. Smeeding and Sullivan [1998] discuss the relative income of different birth cohorts in the US, Canada, the UK and Sweden. No attempt is made here to summarize the literature, which is massive even for a single country—see Beach and Slotsve [1996], Beach, Slotsve and Vaillancourt [1996], Burbidge, Magee and Robb [1996], Doiron and Barrett [1994], MacPhail [1996], Picot [1996], and Richardson [1994], for a sample of Canadian studies.
2. Although estimates of the confidence intervals surrounding these point estimates are not presented here, interested readers can find such estimates (for the population as a whole), as calculated using a bootstrap methodology, in Osberg and Xu [1999].
3. Disposable income consists of the sum of gross wages and salaries, farm self-employment income, non-farm self-employment income, cash property income, sick pay, disability pay, social retirement benefits, child or family allowances, unemployment compensation, maternity pay, military/veteran/war benefits, other social insurance, means-tested cash benefits, near-cash benefits, private pensions, public sector pensions, alimony or child support, other regular private income, and other cash benefits; minus mandatory contributions for the self-employed, mandatory employee contribution, and income tax.

4. A set of data tables presenting detailed results for each cohort are available at http://is.dal.ca/~osberg/home.html. Cohorts are set to approximately fifteen years, with slight variations to fit historic dates such as the end of war in 1945/46, and the Depression's onset in 1929/30.
5. In 1973 and 1978 the German data present the age of the respondent in five year intervals which do not align exactly with cohorts as defined here. The results reported are for the ten year age interval which is unambiguously within the cohort—e.g. German "baby boomers" in 1973 are those Germans borne from 1948 to 1957.
6. This paper uses the PPP for Individual Consumption by Households (ICP classification) rather than GDP PPP. The most recent available is for 1990, which is inflated using the implicit price deflator for consumption. Sources: OECD 1998 *National Accounts. Main Aggregates.* Volume 1. 1960-1996 (1.OECD 1.51) price deflators; OECD 1990 Purchasing Power Parities and Real Expenditures EKS Results. Volume 1. (Table 1.5, Pages 30-31, 1.OECD 23.8 1 v.1).
7. See Phipps and Burton [1995] for estimates of the impact of different sharing assumptions on the prevalence of child poverty in Canada.
8. Phipps and Garner [1994, 13] argue that if one uses the same methodology for estimating equivalence scales, United States and Canadian results are statistically and practically indistinguishable. Burkhauser, Smeeding, and Merz [1996] emphasize the differences in incidence and patterns of poverty implied by alternative equivalence scale methodologies in official use in Germany and the United States and provide estimates of the sensitivity of the poverty rate in the US and Germany to alternative scale elasticities. See also Buhmann et al. [1998]; Coulter, Cowell, and Jenkins [1992].
9. Figini notes that "OECD and other two-parameter equivalence scales empirically used show a similarity of results [in measurement of inequality] to one parameter equivalence scales with elasticity around 0.5" [1998, 2].
10. For further discussion of inequality indices see Osberg [1984] or Jenkins [1991].
11. See data Appendix, Tables 1a to 1e, available at http://is.dal.ca/~osberg/home.html.
12. To maintain comparability, the discussion focuses on calculations for residents of the former West Germany. Results for unified Germany are labelled 1994 +DDR.
13. With respect to individual earnings, there is an ongoing debate [Acemoglu, 2001] about whether a trend to increased dispersion in individual wages emerged in the 1970s or the 1980s in the US. However, the debate about the dispersion of factor returns needs to be distinguished from assessment of trends in inequality of consumption possibilities.
14. The Theil index can be decomposed [where R_g = the cohort Theil index and R = the Theil index for all individuals, n_g= number in cohort g, n = Total population, Y_g = average income of gth cohort, Y = average income of all persons] as: $R = \Sigma_g((n_g Y_g)/(nY))\times R_g + (1/n)\ \Sigma_g(n_g(Y_g/Y)\log(Y_g/Y))$. Each cell entry in Table 2 is the ratio of the first left-hand side term (that is, the weighted average of within group inequality) to total inequality.
15. See Osberg and Sharpe [2000, Table 104-A]. Kilfoil [1998] compares married couples in 1991 in Canada, the US, Australia, Finland and Holland and notes that Americans work substantially more at all points in the family earnings distribution. Standardizing for hours worked, pre-tax household earnings (in PPP U.S. dollars) are remarkably similar for all except the top quintile.
16. In Canadian data, there is a distinct "spike" in the income distribution of the elderly, which is due to the fact that many of the elderly have no entitlement to employer pensions and are entirely dependent on the same transfer programs, with the same benefit entitlement rules. The size of this "spike" in the income distribution data depends on the structure of the old age security system, and is less noticeable in a more earnings-related system such as that of the United States.
17. Note, however, that because tuition is free and living costs are supported, Swedish income differentials for the university educated are still sufficient to make investment in higher education privately profitable.
18. For example, in the United States, a widening of the university/high school earnings differential has been observed, but the same is not true of Canada [Bar-Or et al.1995].

REFERENCES

Acemoglu, D. Technical Change, Inequality and the Labor Market. Paper presented at the IRPP/CSLS Conference on Linkages between Economic Growth and Inequality, Ottawa, January 2001.

Atkinson, A. B. The Distribution of Income in Industrialized Countries. *Income Inequality: Issues and Policy Options.* A Symposium Sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming, August 1998, 11-32.

Baker, M. and Solon, G. *Earnings Dynamics and Inequality among Canadian Men, 1976-1992: Evidence from Longitudinal Tax Records.* University of Toronto, 1998.

Bar-Or, Y., Burbridge, J., Magee, L., and Robb, A.L. The Wage Premium to a University Education in Canada, 1971-1991. *Journal of Labor Economics*, October 1995, 762-94.

Beach, P. and Green, D. A. Cohort Patterns in Canadian Earnings: Assessing the Role of Skill Premia in Inequality Trends. *Canadian Journal of Economics,* November 2000, 907-936.

Beach, C. N. and Slotsve, G. A. Are We Becoming Two Societies: Income Polarization and the Myth of the Declining Middle Class in Canada. Toronto: C.D. Howe Institute, 1996.

Beach, C., Slotsve, G., and Vaillancourt, F. Inequality and Polarization of Earnings in Canada, 1981-1992. Presented at CILN conference "Labor Market Institutions and Labor Market Outcomes," Hamilton, September 1996.

Beaudry, P. and Green, D. A. Cohort Patterns in Canadian Earnings: Assessing the Role of Skill Premia in Inequality Trends. *Canadian Journal of Economics,* November 2000, 907-936.

Brandolini, A. A Bird's-Eye View of Long-Run Changes in Income Inequality. Research Department, Bank of Italy, August 1998.

Buhmann, B., Rainwater, L., Schmaus, G., and Smeeding, T.M. Equivalence Scales, Well-Being, Inequality, and Poverty: Sensitivity Estimates across Ten Countries using the Luxembourg Income Study (LIS) Database. *Review of Income and Wealth,* 1998, 115-42.

Burbidge, J. B., Magee, L., and Robb, A. L. Canadian Wage Inequality Over the Last Two Decades. Presented at CILN Conference, Hamilton, Ontario, September 1996.

Burkhauser, R. V, Smeeding, T. M., and Merz, J. Relative Inequality and Poverty in Germany and the United States using Alternative Equivalence Scales. *Review of Income and Wealth,* December 1996, 381-400.

Coulter, F. A. E., Cowell, F. A., and Jenkins, S. P. Equivalence Scale Relativities and the Extent of Inequality and Poverty. *Economic Journal*, 1992, 1067-1082.

Dickens, R. Wage Mobility in Great Britain in *The State of Working Britain,* edited by P. Gregg and J. Wadsworth, Manchester: Manchester University Press, 1999.

DiNardo, J., Fortin, N. M., and Lemieux, T. Labor Market Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach. *Econometrica*, September 1996, 1001-1044.

Doiron, D. J. and Barrett, **G. F.** Inequality in Male and Female Earnings: The Role of Hours and Wages. Discussion Paper No. 92-36, University of British Columbia, Vancouver, 1994.

Figini, P. Inequality Measures, Equivalence Scales and Adjustment for Household Size and Composition. Paper presented at the General Conference of the International Association for Research in Income and Wealth, Cambridge, August 1998.

Gottschalk, P. and Smeeding, T. M. Cross-National Comparisons of Earnings and Income Inequality. *Journal of Economic Literature*, 1997, 633-87.

Hagenaars, A. J. M. The Perception of Poverty. Amsterdam: North Holland Publishing Co., 1986

_____. The Definition and Measurement of Poverty in *Economic Inequality and Poverty: International Perspectives*, edited by L. Osberg. Armonk: M.E. Sharpe Publishers,1991,134-56

Higgins, M. and Williamson, **J. G.** Explaining Inequality the World Around: Cohort Size, Kuznets Curves and Openness. NY: Federal Reserve Bank of New York, June 1999.

Jenkins, S. P. The Measurement of Income Inequality in *Economic Inequality and Poverty: International Perspectives*, edited by L. Osberg. Armonk: M.E. Sharpe Inc., 1991, 3-38.

_____. Did the Middle Class Shrink During the 1980's?: U.K. Evidence from Kernel Density Estimates. *Working Papers of the ESRC Research Centre on Micro Social Change*, University of Essex, March 1995.

Kilfoil, M. Two Essays Examining the Impact on Married Couples Earnings Distributions of Standardizing for Differences in Hours Worked. PhD Dissertation, Dalhousie University, Halifax, 1998.

Kotlikoff, L. J. Generational Accounting: Knowing Who Pays, and When, for What We Spend. NY: Free Press, 1992.

MacPhail, F. Three Essays on Earnings Inequality in Canada during the 1980's. PhD thesis, Dalhousie University, Halifax, May 1996.

Mishel, L., Bernstein, J. and Schmitt, J. *The State of Working America 1998-99.* Economic Policy Institute and Ithaca: Cornell University Press, 1999.

OECD. *Employment Outlook* OECD, Paris, 1997.

_____**.** *National Accounts. Main Aggregates*. 1960-1996, Paris, 1998

_____**.** *1990 Purchasing Power Parities and Real Expenditures EKS Results,* Paris.

Osberg, L. *Economic Inequality in the United States*, Armonk: M.E. Sharpe Ltd., 1984.

_____**.** Economic Growth, Income Distribution and Economic Welfare in Canada 1975-1994. *North American Journal of Economics and Finance*, 1997, 153-66.

_____**.** Meaning and Measurement in Intergenerational Equity, in*Government Finances and Intergenerational Equity* edited by M. Corak. Ottawa: Statistics Canada and Human Resources Development Canada, 1998, 131-39.

_____**.** Poverty in Canada and the United States: Measurement, Trends and Implications. *Canadian Journal of Economics,* November 2000, 847-77.

Osberg, L. and Phipps, S. Labor Supply with Quantity Constraints: Results from a Large Sample of Canadian Workers. *Oxford Economic Papers*, 1993, 269-91.

Osberg, L., Erksoy, S., and Phipps, S. How to Value the Poorer Prospects of Youth in the Early 1990s? *Review of Income and Wealth*. March 1998, 43-62.

Osberg, L. and Sharpe, A. International Comparisons of Trends in Economic Well Being. Presented at the American Economics Association meeting, Boston, Massachusetts, January, 2000.

Osberg, L. and Xu, K. Poverty Intensity - How Well Do Canadian Provinces Compare? *Canadian Public Policy*, June 1999, 179-98.

_____**.** International Comparisons of Poverty Intensity: Index Decomposition and Bootstrap Inference. *Journal of Human Resources,* Winter 2000, 51-81.

Phipps, S., and Burton, P. Sharing Within Families: Implications for the Measurement of Poverty Among Individuals in Canada. *Canadian Journal of Economics,* 1995, 177-204.

Phipps, S. and Garner, T. I. Are Equivalence Scales the Same for the United States and Canada? *The Review of Income and Wealth*, March 1994, 1-18.

Picot, G. Working Time, Wages and Earnings Inequality Among Men and Women in Canada, 1981-93. Paper presented at "Labor Market Institutions and Labor Market Outcomes," Hamilton, Ontario, September, 1996.

Richardson, D. H. Changes in the Distribution of Wages in Canada, 1981-1992. Working Paper No. 94-22, Department of Economics, University of British Columbia, 1994.

Smeeding, T. M., Saunders, P., Coder, J., Jenkins, S., Fritzell, J., Hagenaars, A., Hauser, R., and Wolfson, M. Poverty, Inequality and Family Living Standards Impacts across Seven Nations: The Effect of Noncash Subsidies for Health, Education and Training. *Review of Income and Wealth*, September 1993, 229 - 56.

Smeeding, T. M. and Sullivan, D. H. Generations and the Distribution of Economic Well-Being: A Cross-National View. April 1998.

Smith, A. *The Wealth of Nations*, edited by E. Canan, London: University Paperbacks, (1776) 1961.